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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/714,795	11/17/2003	Jian Li	5853-376	2973

30448 7590 09/07/2005

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EXAMINER

SULLIVAN, JULIANNE M

ART UNIT PAPER NUMBER

3737

DATE MAILED: 09/07/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/714,795	LI ET AL.	
	<b>Examiner</b>	<b>Art Unit</b>	
	Julianne M. Sullivan	3737	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 17 November 2003.
- 2a) ☐ This action is FINAL.
- 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
  - 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-16 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 17 November 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
    - a) ☐ All    b) ☐ Some    \* c) ☐ None of:
    - 1. ☐ Certified copies of the priority documents have been received.
    - 2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
    - 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                        | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)               | Paper No(s)/Mail Date. _____  |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>3/29/04, 5/16/05</u>  | 6) <input type="checkbox"/> Other: _____                                    |

## DETAILED ACTION

### *Claim Objections*

1. Claims 1, 3 and 7 are objected to because of the following informalities: there is insufficient antecedent basis for "said breast region" in Claim 1, line 5, "said breast" in Claim 3, lines 2-3 and 4 and "said matrix fitting relation" in Claim 7, line 8. Appropriate correction is required.

### *Double Patenting*

2. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

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3. Claims 1-3, 5, 11 and 15 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over Claims 1-4 of copending Application No. 10/778,973 (U.S. Patent Application Publication No. 2004/067399). Although the conflicting claims are not identical, they are not patentably distinct from each other because the method as disclosed in the '973 application teaches all of the steps claimed in Claims 1 and 11 of the present application, thus the broader language of Claims 1 and 11 of the present application is anticipated by the more specific language of the '973 application. Similarly, the '973 application teaches the features of each of the dependent Claims 2, 3, 5 and 15 of the present application.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

***Claim Rejections - 35 USC § 102***

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claims 1, 2 and 11-13 are rejected under 35 U.S.C. 102(b) as being anticipated by Sepponen (U.S. Patent No. 4,641,659).

Sepponen teaches a method of and apparatus for examining biological tissue including radiating a region of tissue with microwave radiation pulses from a horn antenna that are swept

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across a range of microwave frequencies, where the tissue region may be breast tissue and emits thermoacoustic signals responsive to the microwave pulses that are received by an acoustic transducer array, which then provides electrical signals in response, and forming at least one image of the tissue region from the thermoacoustic signals, where structure is provided to translate the transducer array and/or the antenna (col. 2, lines 32-56 and col. 3, lines 6-26).

6. Claims 1-5, 8, 11 and 14-16 are rejected under 35 U.S.C. 102(e) as being anticipated by Wang (U.S. Patent No. 6,567,688).

Wang teaches a method of and apparatus for examining biological tissue including radiating a region of tissue with microwave radiation pulses that are swept across a range of microwave frequencies, where the tissue region may be breast tissue and emits thermoacoustic signals responsive to the microwave pulses that are received by an acoustic transducer array, which then provides electrical signals in response, and where the radiation pulses span a frequency range of at least 1 GHz, are ultrawideband signals and include a plurality of polarizations, and forming at least one image of the tissue region from the thermoacoustic signals, where the at least one image comprises a plurality of images from fractional portions of the tissue that are combined to form an overall image (col. 1, lines 19-32, col. 2, lines 8-27 and 41-45, col. 4, lines 20-26, col. 5, lines 31-43, col. 8, lines 24-52, col. 9, lines 62-67, col. 10, lines 1-3, col. 12, lines 50-67 and col. 13, lines 1-36).

***Claim Rejections - 35 USC § 103***

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person

having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 6, 7, 9 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wang in view of Bolstad et al. (U.S. Patent No. 5,630,154).

Wang teaches all of the features of the present invention except for expressly disclosing that the images are formed using an adaptive beamforming technique, including providing a sensor array with a plurality of sensor elements, where an array steering vector corresponding to a signal of interest is unknown, representing the array steering vector with an ellipsoidal uncertainty set, bounding a covariance fitting relation for the array steering vector with the uncertainty ellipsoid, and solving the fitting relation to provide an estimate of the array steering vector, and that pattern recognition is performed on the image using adaptive signal processing. In a related field of endeavor, Bolstad et al. teaches computational methods of adaptive beamforming and adaptive signal processing (col. 1, lines 24-38, col. 3, lines 15-42, col. 4, lines 49-67, col. 5, lines 1-4 and col. 6, lines 13-48). It would have been obvious to one of ordinary skill in the art at the time of the invention to have used the methods of Bolstad et al. with those of Wang to reduce the complexity of the calculations required to produce and analyze the images, in order to increase the speed of the processing and reduce the cost of the system (see for motivation Bolstad et al. at col. 1, lines 24-38).

### ***Conclusion***

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Erten et al. (U.S. Patent No. 6,236,862) teaches a related method of adaptive beamforming.

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10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Julianne M. Sullivan whose telephone number is 571-272-6084.

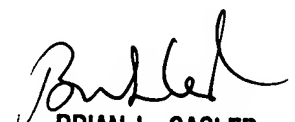
The examiner can normally be reached on Monday through Friday 8:00am to 4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Brian Casler can be reached on 571-272-4956. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



JMS



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